

Appl. No. 09/720,149
Final Amendment and/or Response
Reply to final Office action of 21 October 2004

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CENTRAL FAX CENTER Page 2 of 10
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Amendments to the Claims:

A listing of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121. This listing of claims will replace all prior versions; and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) A device for use in a data bus system, wherein the bus system comprises a host station, a bus cable and the device coupled to the host station via the bus cable, the bus cable comprising a data transfer conductor and power supply conductors for enabling the device to obtain operating power from the bus system via the bus cable, the device comprising

a connector for coupling the device to the bus cable, and

a control circuit coupled to the connector,

wherein

the control circuit is arranged;

to detect whether a power supply is connected to the power supply conductors by monitoring a voltage at a node; and

to start waiting in a slave mode for commands received via the data transfer conductor or

to start operating in a stand-alone mode,

dependent on whether or not connection of the power supply has been detected respectively; and

to signal the host station that the device is in the slave mode by controlling the voltage at the node.

2. (Currently amended) A device according to Claim 1, wherein the bus system comprises a pull circuit for pulling a potential of the data transfer conductor away from a potential of a first one of the power supply conductors, the bus system being arranged to detect whether or not the potential of the data transfer conductor is pulled back to the potential of the first one of the power supply conductors via the bus

Appl. No. 09/720,149
Final Amendment and/or Response
Reply to final Office action of 21 October 2004

Page 3 of 10

cable, so as to determine whether the device is connected to the bus cable, wherein the device comprises

a pull back circuit for pulling back the potential of the data transfer conductor to the potential of the first one of the power supply conductors,

the control circuit enabling and disabling the pull back circuit by controlling the voltage at the node when operating in the slave mode and the stand-alone mode respectively.

3. (Previously presented) A device for use in a data bus system, wherein the bus system comprises a host station, a bus cable and the device coupled to the host station via the bus cable, the bus cable comprising a data transfer conductor and power supply conductors for enabling the device to obtain operating power from the bus system via the bus cable, the device comprising

a connector for coupling the device to the bus cable, and

a control circuit coupled to the connector,

wherein

the control circuit is arranged

to detect whether a power supply is connected to the power supply conductors and

to start waiting in a slave mode for commands received via the data transfer conductor or

to start operating in a stand-alone mode,

dependent on whether or not connection of the power supply has been detected respectively, and,

wherein the bus system further comprises a pull circuit for pulling a potential of the data transfer conductor away from a potential of a first one of the power supply conductors, the bus system being arranged to detect whether or not the potential of the data transfer conductor is pulled back to the potential of the first one of the power supply conductors via the bus cable so as to determine whether the device is connected to the bus cable, the device comprising

Appl. No. 09/720,149
Final Amendment and/or Response
Reply to final Office action of 21 October 2004

Page 4 of 10

a first resistive element and a switching element, connected in series between the data transfer conductor and

a pull back potential source,

the device comprising

a node coupled to a control electrode of the switching element,

a second and third resistive element coupled between the node and the first one and

a second one of the power supply conductors respectively,

so that the switching element is non-conductive when a potential of the node is affected only by the power supplied via the power supply conductors via the second and third resistive element,

the control circuit having an I/O connection coupled to the node,

the control circuit switching the I/O connection as an input to detect whether power is supplied via the power supply conductors and

the control switching the I/O connection as an output to make the switching element conductive to enable pull back.

4. (Original) A device according to Claim 3, wherein

the pull back potential source is the first one of the power supply conductors.

5. (Currently amended) A device according to Claim 1, wherein

the control circuit is arranged:

to detect repeatedly whether power is supplied via the power supply conductors by monitoring the voltage at the node when the device operates in the slave mode or the stand-alone mode, and

to correspondingly switch

~~the control circuit switching from the slave mode to the stand-alone mode and/or vice-versa from the stand-alone mode to the slave mode~~ when absence or presence of the power supply is detected respectively.

Appl. No. 09/720,149
Final Amendment and/or Response
Reply to final Office action of 21 October 2004

Page 5 of 10

6. (Currently amended) A device according to Claim 5, wherein the bus system comprises a pull circuit for pulling a potential of the data transfer conductor away from a potential of a first one of the power supply conductors, the bus system being arranged to detect whether or not the potential of the data transfer conductor is pulled back to the potential of the first one of the power supply conductors via the bus cable so as to determine whether the device is connected to the bus cable, wherein the device further comprises

a pull back circuit for pulling back the potential of the data transfer conductor to the potential of the first one of the power supply conductors, and

the control circuit enabling and/or disabling controls the pull back circuit by controlling the voltage at the node when switching from the stand-alone mode to the slave mode or vice versa respectively.

7. (Currently amended Original) A device according to Claim 6, wherein for use in a data bus system, wherein the bus system comprises a host station, a bus cable and the device coupled to the host station via the bus cable, the bus cable comprising a data transfer conductor and power supply conductors for enabling the device to obtain operating power from the bus system via the bus cable, and the bus system comprises a pull circuit for pulling a potential of the data transfer conductor away from a potential of a first one of the power supply conductors, the bus system being arranged to detect whether or not the potential of the data transfer conductor is pulled back to the potential of the first one of the power supply conductors via the bus cable so as to determine whether the device is connected to the bus cable, the device comprising:

a connector for coupling the device to the bus cable,

a control circuit coupled to the connector, and

a pull back circuit for pulling back the potential of the data transfer conductor to the potential of the first one of the power supply conductors,

wherein

the control circuit is arranged:

Appl. No. 09/720,149
Final Amendment and/or Response
Reply to final Office action of 21 October 2004

Page 6 of 10

to detect whether a power supply is connected to the power supply conductors;
to start waiting in a slave mode for commands received via the data transfer conductor or
to start operating in a stand-alone mode,
dependent on whether or not connection of the power supply has been detected respectively;
to detect repeatedly whether power is supplied via the power supply conductors when the device operates in the slave mode or the stand-alone mode; and
to switch from the slave mode to the stand-alone mode and/or vice versa by enabling and/or disabling the pull back circuit when absence or presence of power supply is detected respectively, and
the pull back circuit comprises
a first resistive element and
a switching element, connected in series between the data transfer conductor and a pull back potential source,
a delay element for holding a voltage across the switching element for a limited time interval after the switching element is signaled to switch from conductive to non-conductive,
the device comprising
a node coupled to a control electrode of the switching element,
a second and third resistive element coupled between the node and the first one and a second one of the power supply conductors respectively,
so that
the switching element is non-conductive when power is supplied via the power supply conductors and
a potential of the node is affected only via the second and third resistive element,
the control circuit having an I/O connection coupled to the node,

Appl. No. 09/720,149
Final Amendment and/or Response
Reply to final Office action of 21 October 2004

Page 7 of 10

the control circuit switching the I/O connection as an input to detect whether power is supplied via the power supply conductors and

the control switching the I/O connection as an output to make the switching element conductive when the device waits in the slave mode.

8. (Original) A device according to Claim 1, wherein the bus system is a USB bus system.

9. (Currently amended) A USB apparatus that is configured to provide at least one function that is independent of providing USB functionality, comprising:

a controller that is configured to

determine whether power is being provided to the apparatus via a USB bus by monitoring a voltage at a node, and

if the power is being provided to the apparatus via the USB bus,

placing the USB apparatus in a slave mode wherein the function is performed in dependence upon communications received via the USB bus, and indicating a connection of the apparatus to the USB bus by controlling the voltage at the node,

otherwise,

placing the USB apparatus in a stand-alone mode wherein the function is performed independent of communications received via the USB bus.

10. (Previously presented) The apparatus of claim 9, wherein

the controller is further configured to provide one or more signals to the USB bus to indicate a disconnection of the apparatus from the USB bus when the controller determines that power is not being provided via the USB bus.

Appl. No. 09/720,149
Final Amendment and/or Response
Reply to final Office action of 21 October 2004

Page 8 of 10

11. (Currently amended) The apparatus of claim-~~10~~ 9, wherein

the controller is further configured to

determine, by monitoring the voltage on the node, whether power is subsequently provided to the apparatus after determining that power is not being provided via the USB bus, and

provide one or more signals to the USB bus by controlling the voltage on the node to indicate a connection of the apparatus ~~from to~~ the USB bus when the controller determines that power is subsequently being provided via the USB bus.

12. (Currently amended) The apparatus of claim 11, wherein

the controller is further configured to ~~delay providing the one or more signals to the USB bus to indicate a connection of the apparatus to the USB bus provide a delay between determining that power is being provided via the USB bus and controlling the voltage on the node to indicate the connection to the USB bus.~~